



Comments to Third R&O and Fourth FNPRM

THIRD REPORT AND ORDER
AND FOURTH FURTHER NOTICE OF PROPOSED
RULEMAKING



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1 Introduction

This document includes 7 layers comments in response to FCC request to the following matter:

In the Matter of)	
)	
Service Rules for the 698-746, 747-762 and)	WT Docket No. 06-150
777-792 MHz Bands)	
)	
Implementing a Nationwide, Broadband,)	PS Docket No. 06-229
Interoperable Public Safety Network in the)	
700 MHz Band)	
)	
Amendment of Part 90 of the Commission's)	WP Docket No. 07-100
Rules)	

THIRD REPORT AND ORDER AND FOURTH FURTHER NOTICE OF PROPOSED RULEMAKING

Adopted: January 25, 2011

Released: January 26, 2011

2 Conformance Testing

2.1 Paragraph 106

Interoperability requires that user devices and network equipment comply with relevant standards specifications. Conformance testing, a process generally planned and developed by industry organizations and conducted by certified labs,¹ is a mechanism that could be used to ensure that devices and network equipment that are deployed in the public safety broadband spectrum are compliant with the 3GPP LTE Release 8 and higher standards. We therefore tentatively conclude that we should require that all user devices be subject to conformance testing and seek comment on this tentative conclusion.

7 layers Comments:

The successful deployment and operations of complex communications systems is dependent on compliance to technical standards such as 3GPP to ensure Interoperability. Such open standards are also the basis for innovation and competition in the commercial marketplace from which Public Safety stakeholders can also leverage many benefits. The 3GPP Radio Access Network - Working Group 5 (RAN5) was established to specifically address user device conformance testing through industry standard test specifications and respective test cases.

The wireless industry to include operators, test laboratories, test equipment vendors, technology providers and devices manufacturers are all integral members to RAN5 activities in terms of user device conformance. Conformance testing, performed by independent and accredited test laboratories, is considered by almost all global wireless operators as the minimum standard by which a user device may be considered as acceptable for network introduction. Operator interest groups to include PTCRB and GCF are the two globally recognized organizations establishing test and certification requirements and procedures. PTCRB and/or GCF certification are typically baseline requirements an operator mandates from user device manufacturers.

¹ 3rd Generation Partnership Project, <http://www.3gpp.org/conformance-testing-ue>; PTCRB, <http://www.ptcrb.com/>; Global Certification Forum (GCF), http://www.globalcertificationforum.org/WebSite/public/home_public.aspx.



7 layers confirms Commission's proposal to subject the user device manufacturers to conformance testing and certification.

2.2 Paragraph 107

While ordinarily it would be appropriate to require conformance testing in advance of network deployment, we note that conformance testing and certification process for user devices operating in LTE Band Class 14—which includes the public safety broadband spectrum—may not be developed as of the release date of this Fourth Further Notice. However, the PTCRB² is expected soon to complete development of such a process. We propose to require that six months following the Commission's release of a public notice announcing the availability of the PTCRB testing process for Band 14, each public safety broadband network operator must certify to the Commission that the operating devices have gone through and completed this process.³ We further propose that in its certification to the Commission, each network operator must also commit to any future testing called for within the certification process. We seek comment on this proposed conformance testing requirement. Do the benefits of conformance testing outweigh the costs associated with our proposal?

7 layers Comments:

Per Fourth FNPRM, PSCR recognizes LTE Band 14 Conformance test cases are not available or validated and therefore not required by PTCRB at this time. Although PTCRB members are committed to LTE Band14 user device conformance testing and certification, 3GPP LTE Band 14 test cases, developed by ETSI⁴, test equipment manufacturers, user device manufacturers and validation organizations will require substantial time (typically 1-2 years) for all test cases to be eventually validated and required by PTCRB. Due to this long development cycle, PTCRB updates the certification test case requirements quarterly via NAPRD⁵ releases to promote the

² PTCRB is a global organization created by Mobile Network Operators to provide an independent evaluation process where GSM / UMTS Type Certification can take place. See PTCRB, <http://www.ptcrb.com/>.

³ Device manufacturers have their devices tested and certified through PTCRB certified labs. See PTCRB, <http://www.ptcrb.com/>.

⁴ ETSI The European Telecommunications Standards Institute is an independent, non-profit, standardization organization in the telecommunications industry (equipment makers and network operators) in Europe

⁵ NAPRD North American Permanent Reference Document specifies a common approach to the certification testing of GSM/UTRA terminal equipment



testing, certification and early adoption of technologies and respective user devices. Per PTCRB procedures, once a user device is tested and PTCRB Certified, according to a specific NAPRD, the user device manufacturer is not required by PTCRB to perform additional testing when PTCRB updates certification requirements in subsequent NAPRD quarterly releases. The exception to this rule is when the user device manufacturer updates software or hardware versions of that user device model. Such updates shall require user device manufacturers to submit a PTCRB ECO (Engineering Change Order) and comply with latest PTCRB NAPRD release version requirements which may include new validated test cases. The stakeholders to include operator, device manufacturers and device users play a vital role when a user device manufacturer obtains user device PTCRB Certification at an early stage when not many test cases are validated and required for initial PTCRB Certification. In these early stages it is important all parties weigh the importance of deploying such devices given the potentially limited testing performed to date. In such cases when PTCRB Certified user devices are deployed with minimal conformance testing completed, the stakeholders identify and correct non-compliance issues observed during network operations. In these cases user device manufacturer may resolve such non compliance with firmware updates through the PTCRB ECO process.

7 layers concurs with Commission's proposal to release a public notice when PTCRB initiates LTE Band 14 certification. Such public notice shall provide operators six months to certify to Commission that all operational LTE Band 14 user devices are PTCRB Certified. Before and during this six month period stakeholders should monitor network and device performance for non compliance. Stakeholders should analyze these observations and work to isolate root causes. If discrepancies are identified as the user device fault then operator should encourage user device manufacturer to resolve the issue with firmware updates and submit user device to PTCRB ECO process. The objective is to continually analyze network and user device performance particularly for those operational devices that achieved PTCRB Certification at the early stages when minimal test cases were validated and required for PTCRB Certification. Non-conformant devices remaining operational in the Public Safety network may significantly impact network Interoperability.

7 layers also concurs with Commission's proposal to require each operator to commit to any future testing within the certification process. 7 layers reiterates the PTCRB



PPMD⁶ requirement that both PTCRB Operator Full Membership categories mandate that PTCRB operators shall "...not distribute non-PTCRB certified devices...". The above PPMD membership conditions thereby supports Commission's motivation to require operators to commit to any future testing within the certification process.

7 layers is an industry leading, independent, PTCRB / GCF accredited test laboratory with more than a decade of industry experience to include development, validation, verification and testing. 7 layers has witnessed the value of conformance testing in the form of minimized product development cycles, minimized total development costs, faster time to market and interoperability. The growing number of PTCRB operator memberships also highlights the wireless industry's perceived value of conformance testing. See Appendix A for more description on 7 layers.

2.3 Paragraph 108

We also seek comment on conformance testing for LTE infrastructure equipment. Is there any known conformance testing with some formal certification process for LTE infrastructure equipment, namely EPC, including eNodeB, MME, SGW, PGW and PCRF?

7 layers Comments:

We are not aware of such a formal conformance certification process in the commercial infrastructure industry. However, some organizations such as Multi Service Forum (MSF), a global organization is promoting worldwide compatibility and interoperability of network elements and encouraging input to appropriate national and international standards bodies. We further see a need for such an organization and a test and certification process for LTE infrastructure equipment to ensure the highest level Interoperability within the operational public safety network.

To what extent is such process used by commercial network providers?

7 layers Comments:

Commercial network operators utilize their own test bed or use the infrastructure provider test bed or request test results from the infrastructure providers as evidence of conformance.

⁶ PPMD, PTCRB Program Management Document is to provide the framework within which GERAN, UTRA and E-UTRA device certification can take place

Finally, we seek comment on who should represent public safety at PTRCB? Should it be the PSST, NIST or another entity?

7 layers Comments:

The public safety hosting certification body should represent public safety's interests at PTRCB.

3 Interoperability Testing

3.1 Paragraph 111

What are the costs and benefits of IOT on roaming interfaces? Have we identified an appropriate list of interfaces on which IOT is necessary to ensure roaming capability among public safety broadband networks? Are there interfaces that should be added to this list, and if so, what would be marginal costs associated with requiring IOT for such interfaces?

7 layers Comments:

It needs to be ensured that the operation of public safety radio devices linked to their home public safety controlling center are correctly handed over to the visited public safety controlling center. In addition the radio devices need to work correctly within the visited radio environments. This means that IOT need to be ensured for this case on at least two interfaces:

1. Public Safety Radio Interface
2. Public Safety Control, Center Interface

3.2 Paragraph 113

Should the commission adopt IOT rules to ensure multi-vendor interoperability on public safety broadband networks? What are the potential costs and benefits of such a requirement? Does the preceding list include all of the interfaces on which IOT should be required to support multi-vendor interoperability or are there other interfaces that should be included?

7 layers Comments:

For effective operation of public safety devices (digital radios and control centers) it is essential, that all public safety specific terminals work trouble-free interacting with all the other components within the public safety environment and ensure interoperability of technical features. These features must be developed and coordinated with the need for public safety organizations and their operational

tactical requirements (device features). Only such devices may be used in the public safety environment, that are error-free and interoperability has been demonstrated.

The standard IOT interfaces should be:

- a) Public Safety Radio Interface
- b) Public Safety Control, Center Interface
- c) Public Safety SIM card Interface
- d) Public Safety Man-Machine Interface

All interfaces should correlate with specific public safety feature groups. Each feature group should be described in terms of their expected interoperability behavior corresponding to special interoperability test scenarios (test plans).

3.3 Paragraph 115

We observe that commercial broadband service providers, who perform IOT to ensure interoperability among devices and network infrastructure, generally own or operate laboratories in which they can perform IOT. Because it is similarly important for public safety networks operators to have access to IOT for the purpose of verifying interoperability, we tentatively conclude that certain lab facilities need to be designated for the purpose of IOT. We seek comment on this tentative conclusion.

7 layers Comments:

We propose that an independent, dedicated IOT laboratory is maintained for both operational and planned network infrastructure, user devices and any respective upgrades. Additionally, we also propose a pilot or test network comprising of devices and network infrastructure vendor equipment, and shall perform field testing in a controlled environment to ensure interoperability and performance prior to deployment of public safety broadband network.

Are there facilities already available for conducting IOT for public safety broadband networks?

7 layers Comments:

The only facility that host IOT for public safety has been set-up by the Federal Agency for Digital Radio of Security Authorities and Organisations in Germany for their national TETRA network.

How about federal lab facilities such as NIST/NTIA (PSCR) facilities, or the Idaho National Laboratory (INL)?



7 layers Comments:

It should be investigated if a governmental body may host such an environment that need to be sourced by the different public safety network elements as being used in real life environment.

How about an arrangement with certain commercial service providers to conduct IOT for public safety in their own lab?

7 layers Comments:

It is not realistic to consider one organization setting-up and maintaining a public safety network environment that covers all different public safety network elements. Such an environment may be set-up and financed by the government and operated by a commercial service provider. Operation of the IOP environment and IOT verifications may be separated tasks executed by separate bodies.

How should the lab facility be compensated? Who should pay for the services?

7 layers Comments:

IOT should be compensated by the public safety device vendors.

Who should set and manage the set of guidelines for IOT?

7 layers Comments:

IOT guidelines need to be developed by qualified organizations with experience in the public safety area. These organizations should host appropriate qualifications by independent bodies. At the same time these organizations should also be knowledgeable about the used radio technologies such as LTE.

Who should determine the test plans?

7 layers Comments:

IOT test specifications should derive from the IOT specifications, guidelines and device feature groups. A special Public Safety Device Assessment Body may be responsible to set-up the test plans. It should be consulted by dedicated expert organizations.

Is there a role for the PSST in this process?

7 layers Comments:

PSST may be able to fulfill one of the required roles.



We note that PSCR is developing test plans for its public safety demonstration network. Is it appropriate to use such test plans for IOT? If not, what is an appropriate process for developing test plans for public safety purposes?

7 layers Comments:

The developed test plans be fit already into some areas of an overall IOT concept for public safety radio and control center devices. In any case it will be important to start a program beyond the public safety demonstration network needs.

4 Interoperability Verification

4.1 Paragraph 116

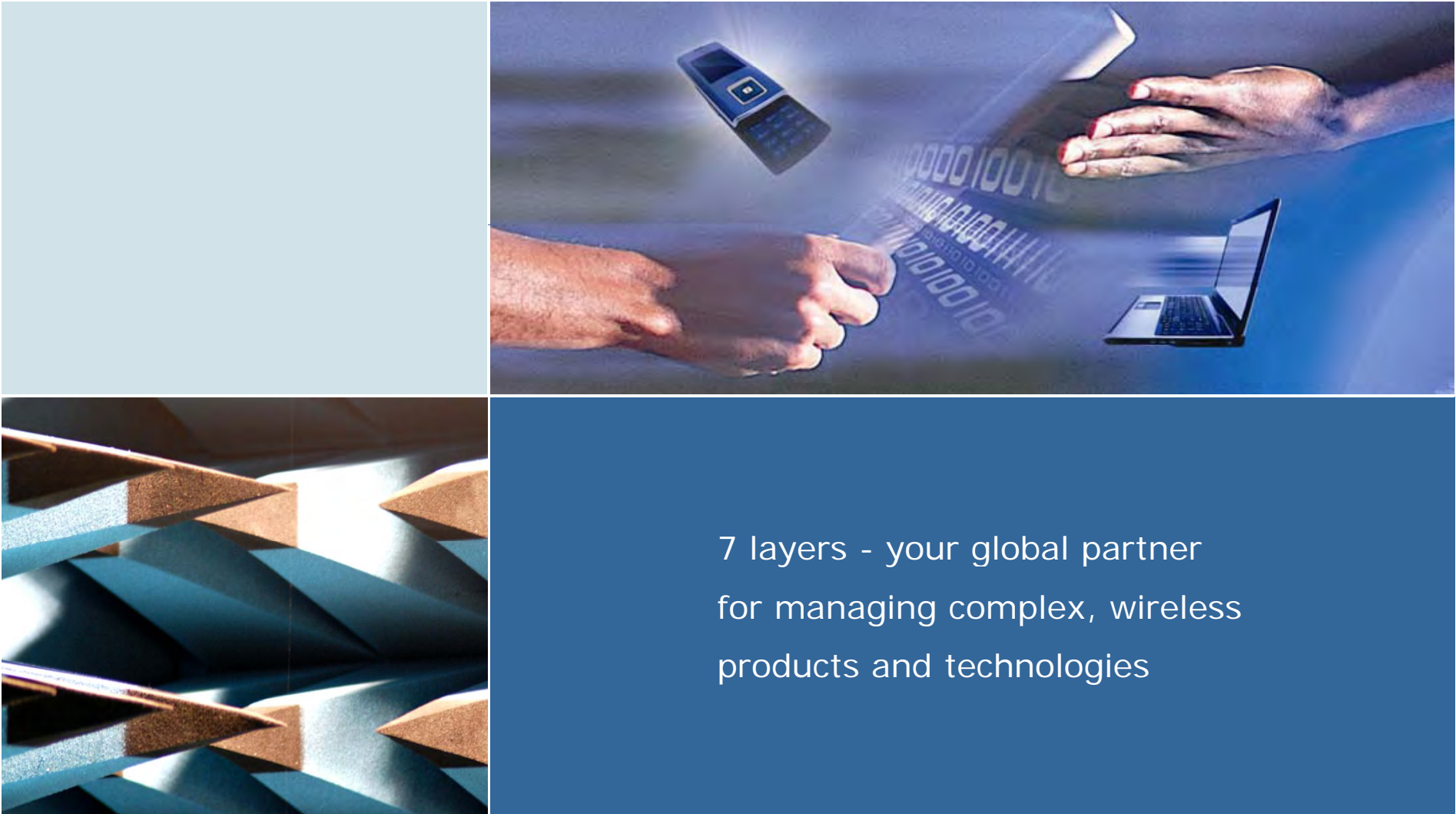
We seek general comment on whether there are other methods, in addition to conformance testing and IOT, of verifying that public safety broadband networks comply with the technology standards adopted for the nationwide network and are technically capable of achieving interoperability. Are any such methods more reliable than IOT and conformance testing for verifying compliance with the technical requirements adopted for the nationwide network? What are the potential costs of implementing any such methods?

7 layers Comments:

At this time, we do not identify any other methodologies more reliable than conformance testing and IOT, analysis of such methods require additional investigation and time

5 APPENDIX A

TESTING FOR A SMARTER WORLD



World-wide group of test and service centers

for

- industries making use of wireless technologies in their products, applications and services

and

- other modern high-tech industries managing complex products and applications



Locations

- Irvine, USA
- Ratingen, Germany
- Sales agency UK
- Sales agency Israel
- Beijing, P.R.China
- Shanghai, P.R.China
- Dongguan, P.R. China
- Sales agency Taiwan
- Suwon Si, Korea
- Yokohama, Japan

The 7 layers business units

The Test House

Test & Market Access Services



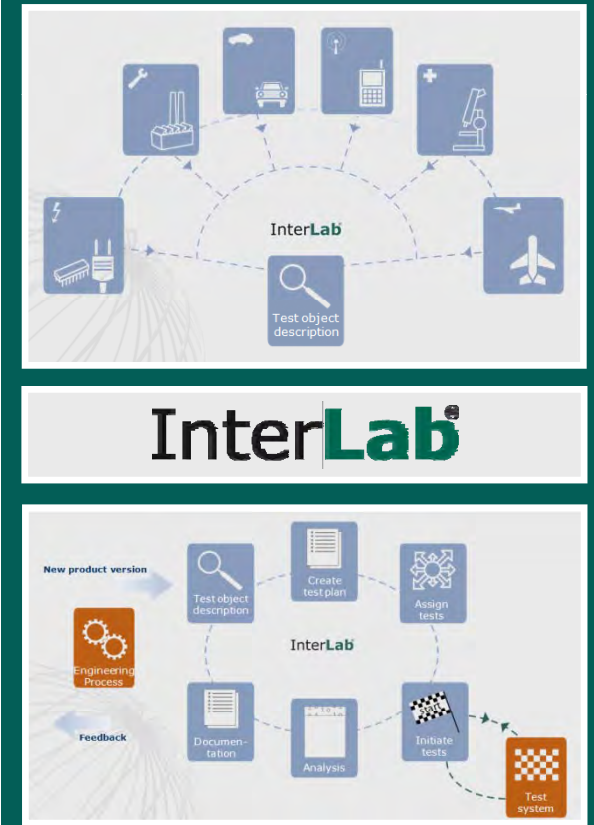
The Systems House

Consultancy, Engineering Services and Products



The Software House

Standard Applications and Software Components



Testing and market access services

for

- chip-sets, protocol stacks and reference designs
- wireless modules, wireless devices, M2M products
- wireless applications

comprising

all important wireless technologies like GSM-family, W-CDMA, HSPA, LTE, Bluetooth®, W-LAN, GPS, WiFi, NFC, JAVA, TETRA etc.

portfolio

- global type approval handling, market access consultancy
- certification and qualification services (GCF, PTCRB BT SIG, ...)
- acceptance/ quality verification services (operators, retailers, ...)
- testing services
 - conformance testing (incl. EMC, OTA)
 - interoperability testing (field testing and others)
 - performance testing
 - application testing

where

in our own and our partners' accredited laboratories



The systems house

Consultancy, engineering services and products

for

industries making use of wireless technologies
for their innovative products, applications and services

supporting

- requirements management
- development processes
- test processes
- certification programs

by integrating

- client specific components
- 3rd party components
- components developed by 7 layers
- InterLab components

or delivering

ready made products like InterLab Feature Explorer, InterLab Test Solutions: LTE USIM/ USAT, 3G USIM/ USAT, Bluetooth, TTY

plus

engineering services like development and validation of test specifications, verification and validation of test systems, etc.,
antenna design services



Standard applications and software components

for

modern high-tech industries
managing complex products and applications

supporting

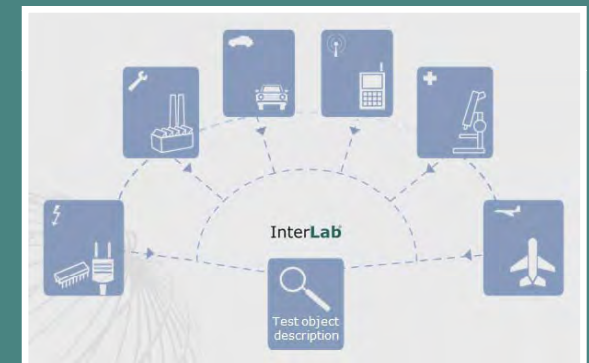
- requirements management
- requirements verification specifications
- requirements quality policy
- agile product management
- test processes
- issue, change request and defect management
- reporting and documentation

by providing

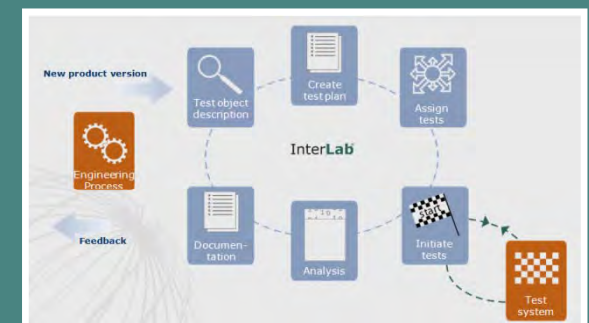
- standard InterLab applications
- InterLab software components
- support and maintenance services

more at

www.interlab.com



InterLab



Our customers and partners

manufacturers of chip-sets, protocol stacks, reference designs and modules



manufacturers of complex products and applications



manufacturers of products and applications employing wireless technologies



network operators, retailers, service providers



regulators and certification-program groups



measurement and test equipment manufacturers



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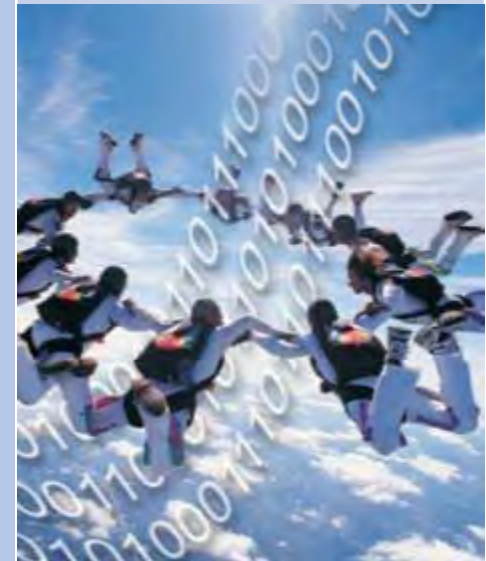
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INTEROPERABILITY AND FIELD TESTING RELIABILITY YOU CAN TRUST

Test House | Systems House | Software House

TESTING IN REAL-LIFE SITUATIONS

Thorough testing processes have to be conducted, to ensure that products and applications with integrated wireless technologies function according to expectations.

In contrast to conformance testing, which is generally speaking laboratory testing against validated test equipment, interoperability and field tests are performed in real-life situations. They compare the product behavior of devices-under-test against qualified equipment and/or in real-life networks. They are performed during the development phase to determine whether market access and quality requirements are fulfilled. In some cases they are also requested for assessments like GCF certification, operator certifications etc.

Interoperability tests are based on the functionality as experienced by the user or the application itself. Due to the fact that interoperability testing is performed at the end points and at functional interfaces, it can only specify functional behavior.

Field testing is a variation of interoperability testing. It examines the behavior of products with wireless connectivity in real-life networks and multiple locations.

INTEROPERABILITY AND FIELD TESTING PROCESSES AT 7LAYERS

Based on years of testing experience with wireless devices, we have a thorough understanding of certification, global type approval and other market requirements. You can rely on our expert know-how regarding wireless technologies such as GSM-Family, HSPA, LTE, Bluetooth®, VoIP, GPS, MMS, Video Telephony, Browsing, FUMO etc.

Our interoperability and field testing services are suitable for testing wireless modules, end-user devices with integrated connectivity as well as for applications.

IMPORTANCE OF INTEROPERABILITY AND FIELD TESTING

Interoperability and field testing provides you with information as to how a wireless module, end-user device with wireless connectivity or an application behaves in real-life situations. It is used for:

- Validation
 - Supporting R&D processes
 - Ensuring readiness for product launches
- Market acceptance
 - Benchmarking with competitors' products
 - Proving purchase requirements
 - Meeting certification and regulatory requirements like GCF, PTCRB, CTIA, R&TTE etc.

INTEROPERABILITY AND FIELD TESTING AT A GLANCE

- Reliable and reproducible results
 - Experienced and well-trained staff
 - Systematic, automated processes
- Global support
- Analysis and debugging support

INTEROPERABILITY AND FIELD TESTING

COVERAGE

- R&D support
 - According to customer-specific test guidelines
 - According to guidelines developed in cooperation with 7Layers experts
- 7Layers Easy-Check
 - Highly economical test services
 - Checking basic functionalities via the most critical test cases
 - Especially geared to M2M devices
- Network operator requirements
 - Vodafone
Certification "time-to-first-fix"
 - Verizon wireless
Field Trial Test specifications for LTE devices
 - O2
Home Zone testing according to O2 Germany specification
 - T-Mobile, Orange, Telefonica, NTT DoCoMo and other network tests upon request
- Retailer requirements
- GCF Certification
according to GCF requirements for 3G and 3G wireless terminals
- PTCRB Interoperability testing
for devices to be launched in the USA
- Bluetooth® CTIA Compatibility Certification
for mobile phones and headsets to be launched in the USA

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Taiwan R. O. C.	+ 886.2.29551270
South Korea	+ 82.70.88532301
Japan	+ 81.45.5340515

PROJECT PROCESS

1. Test Plans

Customized test plans are created fully automatically, based on product features and test requirements

2. Testing

Systematical and highly automated test processes ensure high reliability, reproducible results and enable long test-runs. They are based on

- InterLab® software components
- Precise handling instructions
- Highly qualified, experienced test engineers

3. Feedback on test results

Timely and reliable information on test results and log files is organized either via InterLab® web-access or via customized status reporting at least once a day.

4. Analysis and debugging processes

In case devices fail the testing process, 7Layers offers support through expert analysis, advice and the possibility to upload software updates via the InterLab® system.

5. Reporting

Status reports, detailed reports and final reports are generated fully automatically - a highly efficient and reliable way to prepare trustworthy reports.

YOU BENEFIT FROM

- Globally available services via the global 7Layers group
- Expert advice on suitable networks, network configurations, test locations
- Continuously updated knowledge base of certification requirements such as GCF, PTCRB, Bluetooth® etc.
 - Enabled by active participation in major certification regimes
- Reliable, trustworthy processes
 - Confirmed by ISO/IEC 17025 accreditations for GCF field trial testing and other accreditations of 7Layers
- Thorough understanding of network operator specifications
 - Our working relationship to leading network operators is an important pre-requisite for setting-up efficient test processes
- Support programs
 - Covering updates of products, applications, networks or certification
 - Securely and easily maintaining "Terminal Certified" status